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ABSTRACT

Research in bilingualism has shown that the balance between a bilingual's two languages is rarely even and that there is something special about the mother tongue. Theories concerning separate storage of the two languages and first language primacy predict that: (1) the meanings of translation-equivalent words are not identical, and (2) the meanings in the first language are more saturated with meaning than their counterparts in the second language. This paper reports on a study designed to measure the affective meaning of translation-equivalent words both verbally and non-verbally. For the verbal measurement, twenty-two native Japanese speakers rated a set of carefully controlled words on three seven-step evaluative semantic differential scales for Japanese and English. A similar task with pictographic opposites was used for the non-verbal measurement. The study provided evidence for greater emotional meaning in the subjects of words in their mother tongue, and for a separation in cognitive storage for translation-equivalent words in the Japanese-English bilinguals of the study. (CLK)

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Cognitive Storage of Word Meaning in Bilingualism

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A number of theories have been advanced to account for the relationship between the bilingual's two languages. Personal experience and research both show that the balance between two languages is rarely equal. Almost always one of them is more dominant--the bilingual's command of one of the languages is more complete.

A common and early observation in the literature is that there is something cognitively special about the mother tongue. This is expressed as a prediction that the first-acquired language will be the more dominant. Others, such as Ervin and Osgood (1954) hypothesize that some persons speaking two languages have separate meanings for translation equivalent words. The theories of separate storage and first-language-primacy would predict that 1) the meanings of translation-equivalent words are not the same, and 2) that meanings in the first language are more saturated with meaning than those in the second language.

While it is assumed that translation-equivalent words have the same denotative meaning in both languages (e.g. child has the same referent in both Japanese and English), it would not be predicted that the affective

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meanings (emotional value, impact) would be the same or equally as strong for both words. In this study, the affective meaning of translation equivalent words was measured both verbally and nonverbally. For the verbal measurement, subjects rated all words on three seven-step evaluative semantic differential scales for each language. An example of such a scale would be:

good __:__:__:__:__:__:__ bad

On these scales, the subject could rate a word not only "good" or "bad", but also now good or bad. A check in the blank closest to "good" (#1) meant "extremely good", #2 and #3 were for "quite good" and "somewhat good" respectively. Number 4 was neutral (neither "good" nor "bad"), while #5 and #6 were for "somewhat bad" and "quite bad" with #7 being the worst of all.

The verbal evaluative scales for English were good/bad, nice/awful, sweet/sour. The three scales for Japanese translate into English as pleasant/unpleasant; good/bad; comfortable/uncomfortable. These scales were chosen as the best representatives of the evaluative factor of affective meaning in independent research with Japanese and English in Charles Osgood's cross-cultural research (See Osgood, May, and Miron, 1975). ~~(Representatives of the other affective factors were tested also but cannot be discussed due to stringent length restrictions).~~

The nonverbal scales were chosen from a pool of more than a hundred pictographic opposites. These were the scales which American subjects used the most similarly to the English evaluative scales (see French, 1974). They were used the same way as the verbal ones.

WORDS

The words were chosen by a process of back-translation. A list of possible words was translated from English to Japanese by a fluent bilingual. The resulting list of Japanese words were translated back into English by a second, without seeing the original. This was repeated five more times with five different fluent bilinguals. Those words which "made it" back into English unchanged after five blind translations were considered translation-equivalent and comprised the list of 24 words used in this study (24 English words and their 24 Japanese translation-equivalents).

SUBJECTS

For all 22 subjects, their mother tongue was Japanese, and they learned it in Japan. One-half of them were given the 24 words in Japanese to rate on Japanese verbal and nonverbal scales. This testing was done by a Japanese-English bilingual research assistant who spoke entirely in Japanese as she gave instructions and answered questions. Approximately a week later, these same subjects were given the English translation-equivalents (another list of 24 words) by the same research assistant to rate on the English verbal and the same nonverbal scales. This time, the research assistant spoke entirely in English. The other half of the subjects received these same materials and the same procedure, but in reverse order. That is, they were tested first in English and then in Japanese.

RESULTS

Considering first the words scores on the verbal scales: -- In general, the meanings of the translation-equivalent words are rarely the same. (See Table 1). However, the differences are not extreme, always less than one

Table 1

Evaluative Scores for English and Japanese Equivalents

	English equivalent	Non-Verbal	Verbal	Japanese equivalent	Non-Verbal	Verbal
1)	beauty	2.4[2]	1.9	Utsukushisa	2.3	1.3
2)	earthquake	4.8	5.3	Jishin	5.3	5.9
3)	child	2.4	2.3	Kodoma	2.6	2.6
4)	crow	4.2	4.9	Karasu	4.6	5.3
5)	heaven	2.4	1.9	Tengoku	2.6	1.9
6)	fog	3.9	3.6	Kiri	4.3	2.9
7)	old people	4.2	3.9	Rojin	4.6	3.6
8)	ghosts	4.5	4.9	Yurei	4.6	5.3
9)	law	3.9	3.9	Horitsu	3.9	3.6
10)	pollution	5.1	5.9	Kogai	5.9	6.6
11)	bird	2.4	2.9	Tori	2.6	2.3
12)	orphan	4.2	4.3	Koji	4.3	4.3
13)	mountain	2.1	2.3	Hama	2.6	1.9
14)	death	5.4	5.3	Shi	5.6	5.6
15)	beggar	4.5	4.9	Kojiki	5.3	5.6
16)	white	3.0	2.6	Shiro	3.3	1.9
17)	sex	2.7	2.6	Sei	2.9	2.3
18)	war	5.4	5.9	Sensō	5.9	6.3
19)	sisters	2.7	2.6	Shimai	2.6	2.3
20)	insect	3.3	4.6	Konchū	3.6	4.3
21)	savings	2.4	1.9	Chokin	2.6	2.3
22)	one	2.7	2.9	Ichi	2.6	2.3
23)	blind (people)	4.5	4.9	Makura	4.9	4.9
24)	murder	5.7	5.9	Satsujin	6.3	6.6

[1]Ratings were coded from 1 to 7 such that 1 is the best and 7 the worst possible score.
[2]Concepts were also presented in characters.

scale unit. But, this is what would be expected from a common-sense point of view. Beauty is very good in both languages--somewhat better in Japanese, but still very good. Earthquake is very bad--not equally so in both, but a terrible thing. If such similarity were not found (e.g. Beauty good in one language and bad in the other) one would expect translation failure, subject non-attention (or worse) or massive keypunching or programming errors.

However, the pattern of these minor differences do add up to a significant difference. In three out of 24 cases, the polarity was equal. Heaven is just as good, orphan and blind people just as bad in both languages. But for 18 out of 24 words, the meaning was more extreme in the subjects' mother tongue (Japanese) than in his second language (English) ($p < .001$). Sisters and Old People are better in Japanese. Pollution is worse in Japanese. When measured nonverbally, the meaning of Japanese words was generally more extreme also (16 out of 24) but this trend was not significant.

SCALES

Comparing the use of Japanese, English, and nonverbal scales provides corroboration for the above results. (The measure used here was the standard deviation of the scales (a measure of variability such that a low standard deviation indicates that judgements were generally neutral and a high one indicates that judgements were generally extreme)).

The first comparison is the degree of extremeness of the Japanese versus the English scales. The Japanese verbal scales were used more extremely than those in English for every subject but one ($p < .001$).

The second comparison is the correlation of Japanese with English verbal scales versus that of the same nonverbal scales as used with Japanese and English words. While Japanese and English verbal scales were different scales,

for a significant number of subjects (17 out of 22, $p < .01$), their ratings were more similar than when the pictographs were used. This is perhaps the strongest evidence for a separate storage of meanings in the two languages.

It is difficult to produce evidence for separate storage via translation-equivalent words. Broad and consistent differences in the affective meaning of words would be more likely considered evidence for non-equivalence of translation-equivalent words--the common and probably correct notion that no two words mean exactly the same.

However, that these minor differences were in a particular direction is not accounted for by such an explanation. That words in the mother tongue have a greater affective meaning (a higher emotional value) than those in the second language--and that adjectives are used more extremely--is an intuitively reasonable result. And is evidence also for different meanings in the two languages.

But by far the strongest evidence is presented by the nonverbal scales. If the bilingual's meanings for the translation-equivalent words were the same, then minor differences in scores would be expected on the verbal scales in Japanese and English simply because they are different scales--different adjectives. If the meanings were really the same, this variation would not be expected on the nonverbal scales since they are simply the same scales presented twice. But the result was that a difference between the use of the verbal scales in the two languages was found also with the nonverbal scales, and further, for a large majority of subjects (17 out of 22), the difference was greater (correlation was lower).

Thus, this study provided evidence for a greater emotional meaning in these subjects of words in their mother tongue and for a separation in cognitive storage for translation-equivalent words in these Japanese-English bilinguals. Future work will include the replication of these results with a larger subject population and a larger selection of words--and associating the individual differences found here with language-relevent aspects of each subject's personal history, perhaps accounting for the minority of exceptions in these results.

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